Best Practice

EVIDENCE-BASED CASE REVIEW

Treating hypertension

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Summary points

- Reduction of diastolic blood pressure by 5 to 6 mm Hg reduces the risk of stroke by 42% in hypertensive patients
- The same reduction in diastolic blood pressure reduces the risk of coronary heart disease by 14%
- Most of the randomized controlled trials have used either β blockers or diuretics as the antihypertensive agent
- Diuretics (thiazides) seem to be superior to β blockers in reducing the risk of stroke

CASE HISTORY

The patient, a 66-year-old retired bar owner, Mr C, was admitted to the hospital with a sudden onset of weakness affecting his right arm and right leg. His wife had been unable to get him out of bed earlier that morning. She had noted that his speech was slurred and initially had thought that he was very confused. The day before, he had knocked his head against a car door but had seemed all right at the time. He had no history of transient ischemic attacks. A diagnosis of essential hypertension had been made 4 years previously, and angina pectoris had been diagnosed 2 years previously. Although his general practitioner had prescribed antihypertensive treatment, Mr C did not like the side effects of the drug and stopped taking it 3½ years ago. His only other medication was sublingual glyceryl trinitrate (nitroglycerin) as required. He smoked 20 cigarettes a day, having started at age 20, and consumed 40 units of alcohol per week. Mr C's father had died of a myocardial infarction at age 69, and his mother had died of a stroke at age 70. He had no siblings.

Physical examination revealed his power to be reduced at 3/5 in his right arm and right leg, and he had an expressive dysphasia. Tone was increased on the right, with a right extensor plantar response, and he had hyperreflexia on the right compared with the left. He was continent and had fair sitting balance.

A 12-lead electrocardiogram confirmed that Mr C was in sinus rhythm with left ventricular hypertrophy and an old inferior myocardial infarction. His full blood cell count, erythrocyte sedimentation rate, random blood glucose concentration, and levels of troponin T, urea, creatinine, and electrolytes were all within the normal range. A fasting lipid profile revealed a cholesterol concentration of 7.2 mmol/L (278 mg/dL). A computed tomographic scan of the brain showed a cerebral infarct in the internal capsule. Doppler studies showed no significant stenosis of the carotid arteries. Echocardiography showed good left ventricular function with an ejection fraction of 59% and mild mitral regurgitation. After rehabilitation, Mr C was discharged home, independently mobile with a walker.

When the patient was seen in the outpatient clinic 8 weeks later, his primary care physician had sent a letter expressing concern at Mr C's continued raised blood pressure, which in the clinic was 182/102 mm Hg sitting. On further inquiry, the patient indicated that although he had been discharged home with the medications aspirin, pravastatin, and atenolol, he had taken only aspirin after discharge. He had not had any adverse effects from the drugs but was reluctant to take any medication and wanted to know exactly what evidence existed that he would benefit from taking regular antihypertensive medication, especially because he was totally free of symptoms.

WHAT IS THE EVIDENCE FOR TREATING ONGOING HYPERTENSION IN PATIENTS WHO HAVE HAD A STROKE?

Searching for the evidence

With increasing access to the Internet and articles on health in popular media, patients are becoming more knowledgeable about their illnesses, and some want to discuss with their physician the information they obtain from these sources. For physicians to keep abreast of every new development in every field of medicine is impossible, but it is important that they develop skills in seeking new information that they can assess and use to make informed decisions.

Mr C's risk factors for stroke

- Age
- Hypertension
- Ischemic heart disease
- Hyperlipidemia
- Smoking
- Heavy alcohol consumption

Mr C wants to know what evidence exists that would support his taking antihypertensive and lipid-lowering drugs. Although most of the standard medical textbooks clearly state that hypertension is a risk factor for stroke (see box) and should be treated, few quote the exact evidence on which this conclusion is based.

The ideal evidence to convince Mr C to take antihypertensive drugs would be large randomized controlled trials showing a substantial benefit in patients who received treatment. One of the easiest and most readily available sources to start with is MEDLINE. First, I need to decide which words to use in my search and how far back to extend the search. Although initially I was going to use "hypertension" and "stroke," by consulting MEDLINE's thesaurus, I learn that "cerebrovascular disorders" is a better term to use than "stroke." I decide to go back as far as 1990 for the search.

Appraising the evidence

When I use the terms "hypertension" and "cerebrovascular disorders," MEDLINE provides 970 records, but when I limit the search to randomized controlled trials and only those in the English language, it gives 43 references. Although it might be possible to restrict the search further, I prefer to print out the references and look at the title of the study and the journal in which the study was published. By doing this, I was able to select 3 references that may answer Mr C's question.[1-3]

Summarizing the evidence

Fortunately, someone has already done an overview of 14 randomized controlled trials of blood pressure, stroke, and coronary heart disease.[1] These trials involve a total of 37,000 people randomly allocated to antihypertensive treatment (mainly diuretics or β blockers), with a mean treatment duration of 5 years. For most of these trials, a cutoff blood pressure of 140/90 mm Hg was used to determine hypertension. The results indicate that a decrease in the diastolic blood pressure of 5 to 6 mm Hg reduces the risk of stroke by 42% and coronary heart disease by 14%. The Systolic Hypertension in the Elderly Program,[2] in which 4,736 people from 447,921 screened participants aged 60 years and older were randomly allocated to either active or placebo treatment, showed that the treatment of isolated systolic hypertension in elderly people decreases their risk of stroke by 36%.

In another study, 4,396 patients aged 65 to 74 years with mild to moderate hypertension were randomly assigned to receive diuretic, β blocker, or placebo.[3] Patients in the treatment group had a 25% reduction in stroke and a 19% reduction in coronary artery events. In this study, supported by others,[4] diuretics seem to be superior to β blockers in reducing the risk of stroke in older people with hypertension. None of the trials included very elderly patients, as a consequence of which the question of whether they will benefit is somewhat uncertain (a trial is under way to answer this).[5]

CONCLUSION

Firm evidence exists that treating hypertension in persons at risk is beneficial and substantially reduces the risk of both stroke and, to a lesser extent, coronary heart disease. I relayed the information back to Mr C, who is now agreeable to taking his antihypertensive drugs. Given the findings on the electrocardiogram of an old myocardial infarction and his history of angina, I have decided to prescribe a β blocker. If these were absent, however, the available evidence would support the use of a thiazide diuretic as first-line treatment. If on subsequent review his blood pressure is not adequately controlled with a β blocker, I will add a thiazide diuretic.

References

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